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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,351	06/15/2001	Won-Il Jung	45323 DBP Y35	8658

23363 7590 11/22/2002

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EXAMINER	
BLANTON, REBECCA A	

ART UNIT	PAPER NUMBER
1762	8

DATE MAILED: 11/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-8

Application No.	Applicant(s)
09/882,351	JUNG, WON-[illegible]
Examiner	**Art Unit**
Rebecca A. Bar[illegible]	[illegible]

Office Action Summary

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)[X] Responsive to communication(s) filed on *13 September 2002*.

2a)[X] This action is **FINAL**. 2b)[ ] This action is non-final.

3)[ ] Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)[X] Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)[ ] Claim(s) _____ is/are allowed.

6)[X] Claim(s) *1 and 3-20* is/are rejected.

7)[X] Claim(s) *2* is/are objected to.

8)[ ] Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)[ ] The specification is objected to by the Examiner.

10)[ ] The drawing(s) filed on _____ is/are a)[ ] accepted or b)[ ] objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)[ ] The proposed drawing correction filed on _____ is: a)[ ] approved b)[ ] disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)[ ] The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)[ ] Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)[ ] All b)[ ] Some * c)[ ] None of:

1.[ ] Certified copies of the priority documents have been received.

2.[ ] Certified copies of the priority documents have been received in Application No. _____

3.[ ] Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)[ ] Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) [ ] The translation of the foreign language provisional application has been received.

15)[ ] Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) [ ] Notice of References Cited (PTO-892)
2) [ ] Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) [ ] Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
4) [ ] Interview Summary (PTO-413) Paper No(s).
5) [ ] Notice of Informal Patent Application (PTO-152)
6) [ ] Other

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 3-4, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koksbang et al. (U.S. 5,368,959) in view of Kinard et al. (U S 5,888,582).

Koksbang et al. discloses a lithium metal oxide cathode that is coated with a current collector (abstract). The cathode, taught by Koksbang et al., is a Li-Mn-O-based cathode (column 3 line 5). In column 3 lines 15-19, Koksbang et al. teach that the cathode has a current collector of a conductive polymer coating, where the conductive polymer may be polyaniline. Koksbang et al. do not teach how to apply the polyaniline coating on to the lithium complex oxide cathode. Kinard et al. disclose a method of forming polyaniline films and coatings with a solvent (abstract). The polyaniline films, taught by Kinard et al., are used to form conductive articles, such as batteries (column 2 lines 1-3). Kinard et al. teach that the polyaniline is dissolved into a solvent forming a composition into which the substrate is placed; the coating composition is then dried to remove the solvent forming a polyaniline coating (column 1 lines 48-63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to coat the cathode with polyaniline, taught by Koksbang et al., by dissolving the polyaniline into a solvent, coating the substrate, and then drying the coating to form a

film, as taught by Kinard et al., in the absence of Koksbang et al. teaching a method of forming the polyaniline film on the substrate.

Regarding claim 4, in column 4 lines 24-34, Koksbang et al. teach that the polyaniline is doped by contacting it with an acid.

Referring to claim 12, Koksbang et al. teach that the thickness should be a few microns to 50 microns (column 3 lines 25-26).

Claims 8-9, and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koksbang et al. (U.S. 5,368,959) in view of Kinard et al. (U.S. 5,888,582) as applied to claim 1 above and in further view of Takashashi et al. (U.S. 5,679,480).

Koksbang et al. teach coating a lithium complex oxide cathode with a polyaniline film, as described above. Additionally, Koksbang et al. teach that the cathode material is a Li-Mn-O-based material. Kinard et al. disclose a process for forming a coating of conductive polyaniline film, also disclosed above. Neither reference teaches the exact cathode materials. Takashashi et al. teach that a cathode of a secondary battery may be $LiMnO_2$ or $LiMn_2O_4$ (column 5 lines 7-9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to look to prior art for an appropriate cathode material based on the teaches of Koksbang et al. that the cathode material is a Li-Mn-O-based material, and to use $LiMnO_2$ or $LiMn_2O_4$ in view of the teachings of Takashashi et al. that these are appropriate cathodic materials.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koksbang et al. (U.S. 5,368,959) in view of Kinard et al. (U.S. 5,888,582) as applied to claim 1 above and in further view of Tasaka et al. (U.S. 6,280,854).

Koksbang et al. teach coating a lithium complex oxide cathode with a polyaniline film, as described above. Kinard et al. disclose a process for forming a coating of conductive polyaniline film, also disclosed above. However, neither reference discloses the addition of a conductive agent in the conductive coating. Tasaka et al. disclose an electrode for a secondary battery (abstract). The electrode, taught by Tasaka et al., is formed of a polyaniline, a binder, and a conducting agent (column 2 lines 20-27). Tasaka et al. teach that the conducting agent has the effect of improving the electron conductivity in the electrode composition material (column 5 lines 18-22). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a conductive agent into the polyaniline coating on a secondary battery cathode, as taught by Koksbang et al., in view of the teachings of Tasaka et al. that a conductive agent on a secondary battery cathode improves the electron conductivity in the electrode composition material.

Claims 6-7, 10-11, and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koksbang et al. (U.S. 5,368,959) in view of Kinard et al. (U.S. 5,888,582) and in further view of Tasaka et al. (U.S. 6,280,854) as applied to claim 5 above and in further view of Takei et al. (U.S. 6,337,155).

Koksbang et al. teach coating a lithium complex oxide cathode with a polyaniline film, as described above. Kinard et al. disclose a process for forming a coating of

conductive polyaniline film, also disclosed above. Tasaka et al. teaches the use of a conductive agent in a secondary battery cathode, also disclosed above. However, none of the previous references teaches that addition of an ionic conductive polymer in the coating. Takei et al. disclose a secondary battery that has a cathode consisting of mainly a metal oxide alkali metal and an electrically conductive material (abstract). Takei et al. teach that the cathode may be lithium manganate with polyaniline as the conductive polymer material (column 4 lines 5-21). In column 6 lines 19-22, Takei et al. teach that polyethylene oxide can be used as the polymeric electrolyte in the battery. Furthermore, in column 7 lines 38-43, Takei et al. teach that the conductive polymer and polymeric electrolyte are dissolved in the same coating composition, which forms a coating on the surface of the metal oxide particle. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the polymeric electrolyte into the polyaniline coating on the cathode material, as taught by Koksbang et al., in view of the teachings of Tasaka et al. of including the polymeric electrolyte into the coating on the metal oxide cathodic materials, in the absence of a teaching of Koksbang et al. as to the electrolyte.

Regarding claims 10, 11, and 17-19, Koksbang et al. do not disclose the amount of coated conductive polymer on the surface of the cathode. However, Takei et al. teach that the film layer should have a structure, which partially exposes the metal oxide (column 6 lines 50-53). The amount of coating is a known result effective variable. If the amount of coating is too high the metal oxide particles will be completely coated, however, if the amount of coating is too low, there will not be a sufficient amount of

conductive polymer to act as a current collector. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to experimentally determine the optimum amount of conductive polymer coating on the metal oxide, as taught by Koksbang et al., in the absence of unexpected results, in view of the teachings of Takei et al. that some of the metal oxide surface should be exposed

Allowable Subject Matter

Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The applicant's limitation of carrying out the coating step by using a spray drier to coat lithium complex metal oxide particles with a conductive polymer dissolved in a solvent to form a positive active material for a lithium secondary battery distinguishes over Koksbang et al. (U.S. 5,368,959) because the reference teaches laminating a conductive polymer onto the surface of a lithium complex metal oxide to form a positive active material for a lithium secondary battery.

None of the prior art of record teaches or makes obvious the applicant's claimed invention of using a spray drier to coat lithium complex metal oxide particles with a conductive polymer dissolved in a solvent to form a positive active material for a lithium secondary battery.

Response to Arguments

Applicant's arguments filed 09/13/02 have been fully considered but they are not persuasive.

In response to applicant's argument drawn towards the rejection of claims 1, 3-4, 8-9, and 12, that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Koksbang et al. disclose laminating a conductive polymer coating onto a lithium complex oxide while Kinard et al. disclose a process for coating a substrate with a conductive polymer by dissolving it in a solvent. Both laminating the substrate and coating it with a solution of a conductive polymer dissolved in a solvent results in a substrate covered by a conductive polymer. Therefore coating the lithium complex oxide with a conductive polymer, as taught by Koksbang et al., by dissolving the polymer in a solvent to form a coating solution that is coated onto the substrate, as taught by Kinard et al., in view of the expectation of similar results.

In response to applicant's argument drawn towards claims 5-7 and 10-11, that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5

USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, while Takei et al. teach using a solution of conductive monomers dissolved in a solvent, along with a conductive agent, to coat a lithium complex metal oxide the resulting positive active coating is similar to that produced by dissolving conductive polymers in a solution and coating a lithium complex metal oxide to form a positive active material for use in a secondary battery. The applicant argues that the process of using monomers, as taught by Takei et al., results in the production of γ-MnO_2, which results in poor performance is irrelevant to the rejection. However, Takei et al. is merely used to disclose the use of polymeric electrolytes in a coating for a lithium complex metal oxide used in a secondary battery. Takei et al. teach that a polymeric electrolyte and a conductive polymer are used to form a coating on the lithium complex oxide, such as that used by Koksbang et al., to form a positive active material for a lithium secondary battery. Takei et al. teach that the polymer electrolyte helps form a good electrical contact, as described above. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a polymeric electrolyte in the conductive polymer coating, taught by Koksbang et al., so as to form a good electrical contact on the positive active material of a lithium secondary battery in view of the teachings of Takei et al. that the addition of a polymeric electrolyte helps to ensure a good electrical contact.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rebecca A. Blanton whose telephone number is 703-605-4295. The examiner can normally be reached on M - F (7:30am - 3:30pm)

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on 703-308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

rab
November 18, 2002